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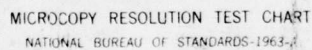
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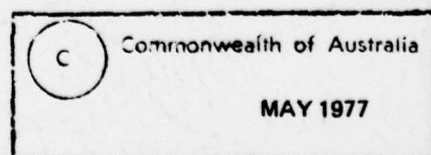
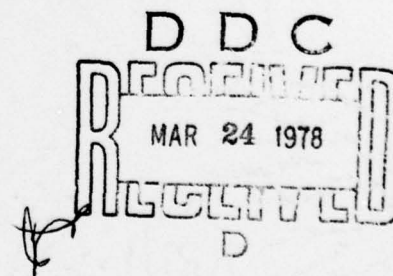
PROCEDURE MANUAL FOR THE APPROVAL OF DESIGNS FOR CIVIL AIRCRAFT

J.O. BOLTON and N.C. FROST



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PROCEDURE MANUAL FOR THE APPROVAL OF DESIGNS FOR CIVIL AIRCRAFT

J.O. Bolton and N.C. Frost

(10) James Ormond/Bolton
Nicholas Colin/Frost

(11) May 77

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S U M M A R Y

This document lays down the procedures to be adopted for approval of Designs of Modifications and Repairs for civil aircraft.

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Designs of Modifications and Repairs for civil aircraft. ↗

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DESIGN APPROVAL PROCEDURE

1. INTRODUCTION

The Department of Transport has authorised Mr James Ormond Bolton and Mr Nicholas Colin Frost for and on behalf of Weapons Research Establishment, (W.R.E.), to approve the designs of modifications and repairs for aircraft within the scope, limitations and conditions of paragraph 2 of this Procedure.

2. SCOPE AND CONDITIONS OF APPROVAL

- 2.1 Mr J.O. Bolton and Mr N.C. Frost have been authorised for the following purposes:

The approval of designs, except those which affect type certification status, relating to structural aspects of modifications and repairs to aeroplanes with maximum take-off weights less than 12,500 lb (5,700 kg) and in addition to the following aeroplanes:

- (a) DH 104 Series
- (b) DH 114 Series
- (c) Douglas DC-3 Series

The approval of designs as covered by and in accordance with the conditions of a Design Advice approved by the Department of Transport.

- 2.2 Mr J.O. Bolton and Mr N.C. Frost may approve.

2.2.1 Designs within the scope of paragraph 2.1, conforming with completely detailed instructions prescribed in manufacturer's service bulletins or equivalent publications or with written directions by the Secretary, Department of Transport.

2.2.2 Designs within the scope of paragraph 2.1 affecting airframe structure which may be justified by standard stressing methods except those which significantly affect the strength or stiffness of primary structure or highly-stressed structure or which depend on specialised or novel fabrication methods for their strength and integrity.

2.2.3 Designs within the scope and conditions of a Design Advice approved by the Department of Transport.

- 2.3 Where a design is outside the scope of paragraph 2.1 or outside the approval powers of the Authorised Signatories as detailed in paragraph 2.2 a form CA259 Design Advice shall be submitted to the Department of Transport or alternatively, in cases where Design Advice action is unlikely to be any advantage, the form CA259 shall be submitted as an Application for Approval of Design (Aircraft) together with drawings and any necessary supporting documents.

3. AUTHORISED DESIGN SIGNATORIES

- 3.1 Mr J.O. Bolton and Mr N.C. Frost have been appointed as authorised persons for the purpose of Air Navigation Regulations 40 and 41. They are responsible within the limitations prescribed in paragraph 2 of this procedures manual prepared by W.R.E. and accepted by the Department of Transport, for the approval of designs.

4. DESIGN REQUIREMENTS

All designs shall be in accordance with the appropriate certification requirements specified by the Department of Transport in Air Navigation Orders Section 101, or such other requirements as may be specified by the Department of Transport.

5. DRAWINGS

5.1 Each repair or modification will be recorded on drawings as detailed below.

5.2 Drawings will be prepared in accordance with standard Weapons Research Establishment, Engineering Wing, drawing office practice.

However, a full set of detailed drawings is unnecessary to cover many situations (e.g. a simple one-off structural repair). In this case pictorial drawings, sketches or photographs may be used, together with sufficient information to show clearly the position of the item in the aircraft, and adequately describe the structural details of the repair/modification.

5.3 The drawings will, where relevant, list the following information.

5.3.1 Applicable design requirement.

5.3.2 Revisions to the aircraft Flight Manual, Maintenance or Operating Procedures and give brief particulars to the section or document affected.

5.3.3 Applicable reports.

5.4 Register of drawings

A register of approved drawings will be kept as instructed in paragraph 8.

5.5 Preparation and checking of drawings

Each drawing will be initialled as follows:

"Drawn" by the draftsman, to certify that the drawings were prepared using standard Weapons Research Establishment, Engineering Wing, drafting practice.

"Checked" by an appropriately qualified person certifying that the applicable dimensions are correct, and that the specified materials, part numbers and finishes are appropriate.

"Approved" by the Project Leader.

5.6 Amendments to drawings

Drawing changes will be achieved by re-issuing the drawing and raising the issue number of the drawing. The initial issue of a drawing will be issue 1.

The raised issue drawings will be distributed to the original recipients as defined in paragraph 5.8. Provision is made on the "Approval" stamp for raising the issue of a drawing. This permits a true copy to be amended without necessarily obtaining a reprint from the original. Such amendments will be made in ink.

5.7 Drawing release procedure

5.7.1 All drawings will contain the aircraft registration number in the title block. This will control the applicability of the drawing. Should an identical design be required to be applied to another aircraft, the drawing number will be changed and the new aircraft registration number used. In this case a note will be made adjacent to the drawing number -

"Identical to drawing....."

5.7.2 Each copy of the drawing will be stamped "Approved", dated and signed by the Authorised Design Signatory to certify that the drawing is released and that

(i) it is a true copy

(ii) the design is approved under ANR 40 or ANR 41 and all documents affecting airworthiness, called up on the drawing, are approved by an Authorised Design Signatory or the Department of Transport. The date shown on the stamp will be the original date of approval of that issue of the drawing from which the copy was made.

5.7.3 The format of the approved stamp to be used by Weapons Research Establishment is:

For and on behalf of :-		
W.R.E.		
<u>APPROVED</u>		
D.O.T. Approval No. -----		
Signature	Date	Issue

5.8 Distribution of drawings

Drawings relating to designs within the scope of the Authorised Design Signatory's approval (paragraph 2.2) will be distributed:

2 copies to the Maintenance or Manufacturing organisation, one of which will be retained by the Chief Inspector, or his equivalent in that organisation. (See footnote on page 6).

1 copy will be filed by the Authorised Design Signatory.

Drawings of designs subject to Design Advice conditions requiring Department of Transport approval will be sent to the Department of Transport (copies as required). The Department, if satisfied, will then approve all copies and return one set to W.R.E., to be held by the Authorised Design Signatory. Copies of the drawings will be provided by the Authorised Design Signatory stamped with "Certified True Copy of D.O.T. approved document".

Drawings of designs submitted to the Department of Transport with a form CA259 used as an Application for Approval of Design (Aircraft) will be handled similarly. Except by special arrangement, 2 copies will be submitted.

5.9 Provisional approval procedures

When the Authorised Design Signatory is not satisfied that a design of a modification or repair will not affect the safety of an aircraft, he may authorise the modification or repair of the particular aircraft with a view to an application being made under ANR 108A for permission to flight test the aircraft, or such other tests that he may specify. The authorisation will be given by stamping and signing the drawing together with a description of the tests required, e.g. subject to "flight test" or "structural test". The Provisional Approval stamp will have the following format.

PROVISIONAL	APPROVED Subject to :-
For and on behalf of W.R.E. D.O.T. Approval No. _____	Signature. _____ Date. _____

The drawings of such designs will not be stamped "Approved" until the Authorised Design Signatory is satisfied that the designs concerned will not adversely affect the safety of the aircraft.

6. CONCESSIONS

Salvage of parts incorrectly manufactured, will be covered by applying for approval on W.R.E. form TSP1746 "Application for Concession". If satisfied the Authorised Design Signatory will stamp the form "Approved", date it and sign it, indicating approval under ANR 41 in accordance with ANO 100.4.

7. REPORTS

7.1 Requirement for a report

A report must be prepared on each of the following occasions:

- 7.1.1 Subsequent to any repair or modification where airworthiness justification is required.
- 7.1.2 Whenever revision to an existing Manual or the introduction of new Manuals is undertaken to cover the installation, operation or maintenance of specialised items of equipment.
- 7.1.3 Whenever flight testing is done to cover the characteristics of the aircraft or of new equipment being flight tested.
- 7.1.4 Whenever the Authorised Design Signatory or an airworthiness officer of the Department of Transport feel that in their opinion the preparation of an engineering analysis is necessary.

7.2 Numbering system

Report numbers will consist of three letters followed by four digits commencing at WRE-R 0001.

The "-R" indicates that the number refers to a report.

No two reports will bear the same number unless the report is a copy of an original which has been raised in issue.

7.3 Checking of design calculations

The checking of design calculations is required and it is the Authorised Design Signatory's responsibility to ensure that the checking is adequate and carried out by a competent person.

7.4 Amendments to reports

Changes to a report will be achieved by re-issuing the report and raising the issue number of the report.

The initial issue will be "issue 1".

The raised issue will be distributed to the original recipients as defined in paragraph 7.5. Provision is made on the "Approval" stamp for raising the issue of a report. This permits a true copy to be amended without necessarily obtaining a reprint from the original. Such amendments will be made in ink.

7.5 Distribution

Reports relating to designs within the scope of the Authorised Design Signatories Approval (paragraph 2.2) will be distributed:

1 copy to the Maintenance or Manufacturing organisation to be retained by the Chief Inspector or his equivalent in that organisation. (See footnote on page 6).

1 copy will be filed by the Authorised Design Signatory.

Reports relating to designs subject to Design Advice action (see paragraph 2.3) will be sent to the Department of Transport (2 copies). The Department, if satisfied, will approve all copies, keeping one copy and returning the remaining one to W.R.E. to be held by the Authorised Design Signatory.

Copies will be provided by the Authorised Design Signatory stamped with "Certified True Copy of D.O.T. approved document".

8. RECORDS

- 8.1 The Authorised Design Signatory will maintain 1 copy of a register in which the following information will be kept for all approved or provisionally approved drawings and reports.

The columns of the register will be:

Column	Column Title
1	Drawing Title
2	Drawing Number
3	Drawing Issue Number
4	Drawing Date of Issue
5	Aircraft Registration Number
6	Aircraft Make and Model
7	Report Number
8	Report Issue Number
9	Report Date of Issue
10	Design Advice No. (if applicable)
11	Distribution of Drawings
12	Distribution of Reports

- 8.2 The Design Advice number will be allocated from this register and will be numbered sequentially from WRE 001.

- 8.3 A monthly list of all drawings and reports approved by the Authorised Design Signatories for W.R.E. is to be submitted to the Department of Transport.

Footnote: Within the context of this document the Chief Inspector is the Quality Assurance Engineer/Workshops and Mechanical Design Division.

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